NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE GENERAL SPECIFICATIONS

UNDERGROUND OUTLET

(No.)
CODE 620

1. SCOPE

Work shall consist of furnishing and installing a conduit beneath the ground surface to a specified grade.

2. LOCATION

The planned location of the underground outlet shall be as shown on furnished drawings or as staked in the field with controlled elevations

3. PUBLIC AND PRIVATE UTILITIES

Utilities are defined to be overhead and underground power or communication lines, and pipelines. All utilities discovered to be in the work area are shown on the drawings or sketches. However, the absence of indicators on the drawings or sketches does not assure the nonexistence of utilities in the work area. The contractor is alerted to conduct his/her own search and discovery for utilities in order to lessen or avoid potential damages. The owner/operator shall complete TX-ENG-80, UTILITIES INVENTORY prior to layout or any ground disturbance and return it to a NRCS representative.

4. MATERIALS

Unless otherwise designated, pipe materials used for the underground outlet shall be new and shall comply with one of the following:

TYPE	SPECIFICATION
Polyvinyl Chloride(PVC)	ASTM D-1785, D-224l, D-2672, D-2740, D-3033, or D-3034 type PSM or PSP, or PIP meeting requirements of NRCS Conservation Practice Standard 430-DD, 430-EE,or Corrugated PVC tubing meeting requirements of NRCS Conservation Practice Standard 606.
Polyethylene (PE) pipe	ASTM D-2104, D-2239, D-2447 0-2737, D-3035 or NRCS Conservation Practice Standard 606.
Acrylonitrile-Butadiene-Styrene (ABS) Pipe	ASTM D-1527, or D-2282.
Asbestos-Cement	ASTM C-663, C-428, C-500 or requirements of NRCS Conservation Practice Standard 430-BB.
Concrete pipe or tile	ASTM C-301, C-412, C-118, C-497, C-14, C-76 or C-478.
Steel pipe	Federal Specification WW-P-405 or NRCS Conservation Practice Standard 430-FF.
Aluminum pipe	Federal Specification WW-P-402 or NRCS Conservation Practice Standard 430-AA.

Conservation practice general specifications are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

Other materials used in inlet, outlet, or appurtenant structure fabrication or construction shall be as shown on furnished drawings or as specified in ***Section 13., Construction Details***. The ends of conduits shall be protected during installation. All appurtenant structures, including trash and animal guards, shall be installed promptly, and provisions shall be made for protecting them during installation.

5. JOINTS AND CONNECTIONS

All joints and connections shall be made so as to withstand the design pressure for the pipeline without leakage and shall leave the inside of the line free of any obstruction that may tend to reduce its capacity below design requirements.

All fittings, such as couplings, reducers, bends, tees and crosses, shall be installed in accordance with the recommendations of the pipe manufacturer.

6. REMOVAL OF WATER

It will be the contractors responsibility to perform work required for the removal of surface or groundwater as needed to perform the required construction in accordance with the specifications and drawings. The contractor will be responsible for the repair of any damage incurred by failure of his dewatering system.

7. TRENCH CONSTRUCTION

Trench width at any point below top of pipe should be only wide enough to permit the pipe to be easily placed and joined and to allow the initial backfill material to be uniformly placed under the haunches and along the sides of the pipe. The maximum trench width shall be 30 inches.

The trench bottom shall be uniform so that the pipe will lay on the bottom without bridging. Clods, rocks and uneven spots which could damage or cause non-uniform support to the pipe shall be removed.

Where rocks, boulders, or any other material which might damage the pipe are encountered, the trench bottom shall be undercut a minimum of four inches below final grade and filled with bedding material consisting of sands or compacted fine-grained soils.

Provisions shall be made to insure safe working conditions where unstable soil, trench depth, or other conditions are such as to impose safety hazard to personnel working in the trench.

8. PLACEMENT

Pipe shall be placed in the trench and allowed to come to within a few degrees of the temperature that it will have after complete covering prior to any backfill beyond shading and prior to connecting to other facilities. Care shall be taken to prevent permanent distortion and pipe damage when handling during unusually warm or cold weather. The pipe shall be uniformly and continuously supported over its entire length on firm stable material. Blocking or mounding shall not be used to bring the pipe to final grade.

For pipe with belled ends, bell holes shall be excavated in the bedding material as needed to allow for unobstructed assembly of the joint and to permit the body of the pipe to be in contact with the bedding material throughout its length.

Unless otherwise specified, the depth of cover shall not be less than 2 feet nor more than 4 feet.

9. INITIAL BACKFILL

Initial backfill is backfill placed from the bottom of the trench to one foot above the installed pipe. Either the hand, mechanical, or water packing methods are optional.

The initial backfill material shall be selected soil or sand free from rocks or stones larger than one inch in diameter and earth clods greater than approximately two inches in diameter. At the time of placement, the moisture content of the material shall be such that the required degree of compaction can be obtained with the backfill method to be used. The initial backfill material shall be so placed that the pipe will not be displaced, excessively deformed, or damaged.

When hand or mechanically backfilling, the initial fill shall be compacted firmly around and above the pipe as required to provide adequate lateral support to the pipe.

When water packing is used, the pipeline first shall be filled with water. The initial backfill, before wetting, shall be of sufficient depth to insure complete coverage of the pipe after consolidation has taken place. Water packing is accomplished by adding water to diked reaches of the trench in such quantity as to thoroughly saturate the initial backfill without excessive pooling of water. After saturation, the pipeline shall remain full until after final backfill is made. The wetted fill shall be allowed to dry until firm before final backfill is begun.

10. FINAL BACKFILL

Final backfill is backfill placed in the trench above the initial backfill. Final backfill material shall be free of large rocks, frozen clods and other debris greater than three inches in diameter. The material shall be placed and spread in approximately uniform layers in such a manner that there will be no unfilled spaces in the backfill and the backfill will be level with the natural ground or at the design grade required to provide the minimum depth of cover after settlement has taken place. Rolling equipment shall not be used to consolidate the final backfill until the specified minimum depth of cover has been placed.

All special backfilling requirements of the pipe manufacturer shall be met.

Work areas shall be restored to their former condition or as specified in **Section 13., Construction Details.** If specified, vegetation or other protective cover shall be established promptly according to technical requirements in the Field Office Technical Guide.

11. CERTIFICATION AND GUARANTEE

All materials shall conform to these minimum requirements and to tests prescribed in the applicable ASTM Specification.

The acceptance of materials used will be by onsite approval based on properly marked material showing compliance with the applicable ASTM Specification.

The installing contractor shall certify to the purchaser that the materials and installation comply with the requirements of these specifications. He shall furnish the purchaser a written guarantee against defective workmanship and materials to cover a period of not less than one year. He shall record on the guarantee the manufacturer's name and marking of the pipe material used.

The installing contractor shall furnish the Natural Resources Conservation Service a copy of his certification and guarantee, which will be made a part of the supporting records of the underground outlet.

12. MEASUREMENT

The amount of underground outlet completed as specified will be determined by measuring the laying length, in feet, of each size and kind of pipe installed. The number and size of inlets, guards, guard posts and outlet pipes measured will be as specified on the drawings. The quantity of each component of the underground outlet which average cost has been established in the county will be measured.

13. CONSTRUCTION DETAILS